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*Stated Meeting, March 18, 1870.*

Present, eleven members.

MR. FRALEY, Vice-President, in the Chair.

A letter accepting membership was received from Mrs. Mary Somerville, dated Naples, Feb. 14, 1870.

Letters of envoy were received from the Royal Academies at Munich, (Dec. 1,) and Vienna, (Aug. 20,) from the R. Society of Zoology at Amsterdam, (Dec. 9,) and the Society at Giessen, Sept. 2, 1869.

Letters of acknowledgment were received from the Societies at Giessen, (77-80), Gottingen, (78-80), Bremen, (73-80), Prof. Bunsen, (78, 79), Historical Acad. at Madrid, (XIII. 1, List, Cat. I, 71, 72, 77), R. Academy at Amsterdam (78-80), R. Library, Hague, (78-80), Observatory at Prague (78-80).

A circular letter respecting the celebration of its 25th anniversary festival, on the 27th of March (April 8th), was received from the Society at Riga.

A letter was read from Captain C. F. Hall, dated Washington, D. C., March 12, 1870, enclosing a petition to Congress, in favor of his proposed Third Arctic Exploring Expedition. The petition was laid upon the table for the signature of the members and others.

Donations for the library were received from the Societies at Moscow, Emden, Frankfurt, Lille, Bordeaux, Montreal and Madison; from the Berlin Academy; Paris Geographical Society; Royal Institution of G. Britain, London; Chemical and Antiquarian Societies; Greenwich Observatory; Dublin Geological Society; Dr. Haughton; the American Antiquarian Society; New York Lyceum; Dr. Geo. B. Wood; and the Peabody Institute.

A Circular from the Smithsonian Institute announced another transmission of correspondence for the 20th April; all envoys to be in Washington by the 15th.

Prof. Cope communicated the results of his examinations of the locality, two miles S. W. from Woodbury, where from 30 to 60 skeletons, some of them women and others children,

were lately exhumed, and the greater part broken up, and spread upon compost heaps. Dr. Leidy has recovered one pretty complete skull, which he exhibited before the Academy of Natural Sciences, at its last meeting, and expressed a decided opinion in favor of its European origin. Professor Cope's opinion was equally confident, that the remains were those of no aboriginal Indian race. Professor Trego suggested that they belonged to that early Finnish or Swedish Colony, which attempted a settlement on the banks of the Delaware, a short while previous to the arrival of the Hollanders and Quakers, under William Penn. The bodies were all taken from a shallow trench, not more than 8 feet wide by 16 long; they had been laid in two tiers or stages, one above the other, and there was no relic, ornament, tool, weapon, or fragment of clothing, to suggest relationship to any age or race; and no appearance of a tumulus.

Prof. Cope exhibited three large photographic pictures of figures of the human foot incised in upper cretaceous red sandstone, near Topeka, thought by western men to be fossil impressions. The shadows in the photographic copies showed plainly the nature of the marks, for the ball of the great toe was an elevation, instead of a depression, and the cutting was carried round the ends of the intervals between the toes. A discussion of the use of the foot in aboriginal picture writing followed.

Dr. Carson recalled the exhibition of a sculptured rock, showing rivers and game, a sort of guide map, taken from the Susquehanna River banks, by Prof. Walter R. Johnson, at the Academy of Nat. Sciences or Historical Society, about 1836 or 1837, and expressed his desire that it should be recovered for use, in comparison with later discoveries.

Dr. Brinton being questioned as to the amount of credence to be given to Baron De Waldeck's alleged Elephant or Mastodon figures, supposed to be recognisable among the hieroglyphics of Mexico, replied that he had had the opportunity of examining M. Charancy's photographs, and agreed with the latter, that no such figures could be made out from the

original designs, but that the figures in question were symbolically compounded of man and serpent, and appear as such in MSS. recently published by the French government.

Mr. Lesley instanced the mammoth, etched on a plate of ivory, found in a cave in France, to clear away any serious improbability from the way of supposing a like physical reminiscence of the Mastodon in this country. He referred, also, to the fact, that the Ancient Egyptian B was graphically represented by the human leg, A by the arm, T by the hand, and that what is called the comb, may have been meant for the foot-mark. In the earliest stage of human life the foot and the foot-print were of superior importance to the hand and its work. But in the second stage of aboriginal life, the hand took precedency of the foot, as symbol of force and skill, combining thought with feeling, the reasoning power with the instinct. It soon entered into the synod of symbolic gods, with its fingers, and obtained a special worship for its hand-print.

Dr. Coates related the origin of the Arabic cyphers on the hypothesis, that they were constructed by posturing with the hands and fingers, singly and in combination.

Pending nominations 649—656 were read.

The following communication was read :

Office of the Commissioners of Fairmount Park, No. 224 S. Fifth Street, Philadelphia, March 12th, 1870.

At a meeting of the Commissioners of the Park, held this day, the following preamble and resolutions were adopted :

WHEREAS, The American Philosophical Society has made a communication to this Commission, proposing that the name of André François Michaux, who travelled long in this country, and described our Oaks and forest trees, in a work of great merit and splendor, should have his name, and that of his father (who had, by like travel and study, rendered service to science), honored in the Fairmount Park, in a manner to be a memorial to their devotions, and to promote the objects which had occupied their lives, and has proposed, after the death of the widow of André François Michaux, to devote the interest or income of six thousand dollars bequeathed by him to said Society, to be expended in execution of the trust of his will in the said Park, for the purpose following. Therefore,

*Resolved*, That there shall be a grove of Oaks in the Fairmount Park forever to bear the name of "The Michaux Grove," in which, if practicable, shall grow two oaks of every kind that will endure the climate.

*Resolved*, That any surplus of revenue received by the Commission from

the Michaux Fund, after satisfying the requirements of the preceding resolution, shall be devoted to the cultivation of Oaks of every variety capable of cultivation in our climate, in the Park nursery, which Oaks, to the extent of two of each kind cultivated, be hereafter distributed to other Public Parks in the United States, under proper regulations to be hereafter prescribed.

Attest, DAVID F. FOLEY, Sec. Park Commission.

On motion of Mr. Price, it was then

*Resolved*, That this Society do agree to the terms contained in the preamble and resolutions of the Fairmount Park Commissioners, adopted on the 12th day of March, 1870, in the expectation and confidence that the planting of the Michaux Grove of Oaks may be soon commenced, so that the Grove shall early become one of the attractions of the Park.

And the Society was adjourned.

#### COMPARISON OF MECHANICAL EQUIVALENTS.

BY PLINY EARLE CHASE.

*Read January 7, 1870.*

The comparison of different mechanical equivalents will open a new field for investigation, which may prove to be fertile in valuable results. For example, recent determinations, by the different methods of Thomsen and Farmer, fix the mechanical equivalent of light, in a wax candle burning  $126\frac{1}{2}$  grains per hour, at 13.1 foot-pounds per minute, the equivalent of 1 grain being 6.213 foot-pounds. According to Dulong, the heat evolved, during the combustion of 1 grain of olive oil in oxygen, is sufficient to heat 9863 grains of water  $1^{\circ}$  C. According to Favre and Silbermann, 1 grain of oil of turpentine, burned in oxygen, would heat 10,852 grains of water  $1^{\circ}$  C.

It may therefore be presumed that the total heat given out by the combustion of 1 grain of wax, is about sufficient to raise 10,000 grains of water  $1^{\circ}$  C., or 18,000 gr.  $1^{\circ}$  F. This represents a mechanical equivalence of  $(18,000 \times 772 \div 7000 =)$  1985.143 foot-pounds, which is 319.5 times as great as the corresponding equivalent of the light given out during the combustion.

Tyndall, in his lecture on Radiation, states that the visible rays of the electric light contain about one-tenth of the total radiated heat. The relative luminous intensity of an electric lamp would therefore appear to be about 32 times as great as that of the wax candle. This ratio so nearly resembles that of solar to terrestrial superficial attraction, and the connection of electric and magnetic currents with solar radiation is so evident, that additional experiments, to furnish materials for a great variety of similar comparisons, seem desirable. While it is possible that the resemblance, in the present instance, may be accidental, the numerous harmonies between the manifestations of cosmical and molecular forces, render it at least equally possible that it may have a weighty significance.